North Dakota

State Education Technology Plan

2001-2003

Department of Public Instruction
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Contents

Executive Summary

The North Dakota K-12 State Educational Technology Plan offers schools in North Dakota a list of goals to strive toward in their pursuit of the integration of technology into the curriculums in their districts and schools. A representative group of North Dakota educators and educational leaders participated in the writing of **The Nine Essential Conditions and Indicators for Technology Integration. (**Bookmarck)

These are nine items that need to be in place in order for a school to be moving in the direction of integrating technology into the curriculum fully. The Nine Essential Conditions and Indicators for Technology Integration should be used by districts in the development of *their own* district technology plans. They can serve as a "road map" of sorts to assist schools in getting their district going in the right direction.

Essential conditions, Indicators and the **methods for measuring** the Indicators are defined and outlined in the full text of this document.

Beyond the direction that is offered through the portion of the document that includes THE NINE we address the fact that funding needs to come from a variety of sources in order to have enough money to successfully integrate technology into the curriculum.

Every effort was made to follow Section 5213. STATE PLANS of H.R.1 "No Child Left Behind Act of 2001" and "e-Learning Putting a World-Class Education at the Fingertips of All Children" the National Educational Technology Plan.

Essential Conditions

Shared Vision

- It is recommended local school districts include stakeholder groups to assist in the development and support of the vision.

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Technology Access and Use

- It is recommended that local school districts have a range of technology tools available with performance capabilities at a level that will support and sustain current learning practices and will also encourage new and innovative learning practices.

- It is recommended that schools and districts have a plan for updating, refurbishing, and /or replacing hardware and software resources.

Leadership Capacity and Proficiency

- It is recommended that local school district leaders model the effective use of technology.
- It is recommended that local school district leaders foster an environment that encourages teacher to try new approaches to learning with technology without fear of reprisal.
- It is recommended that local school district leaders initiate and support professional development opportunities for all faculty and staff.

Educator Capacity and Proficiency

It is recommended that educators be skilled in the use of a variety of models of curriculum design and learning strategies that are supported by technology.

Professional Development Program

- It is recommended that local school districts provide opportunities for educators to become skilled in the use of a variety of models of curriculum design and learning strategies that are supported by technology.

Designs for Effective Teaching and Learning

- It is recommended that local school districts create an environment that encourages teachers to experiment with innovative strategies supported by technology.

Technical Support

- It is recommended that local school districts provide funding mechanisms for on-going costs of employing and retaining adequate technical support staff.

Student Experiences and Application

- It is recommended that local school districts provide opportunities for students to use technology to promote collaborative learning and the development of critical thinking skills.
- It is recommended that local school districts provide a clear set of goals, expectations, and criteria for student learning based on national and state standards.
- It is recommended that local school districts create opportunities for students to work on authentic tasks and to communicate with peers, community members, or experts in the field.

On-going Evaluation and Continuous Improvement (Accountability)

- It is recommended that local school districts develop a systemic process for continuous assessment, evaluation and reporting the extent to which students are progressing and whether educational objectives are being met.

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Preface

Educational technology is a tool that teachers should use to improve the learning process for their students. Teachers who use technology as a tool to support strategies such as problem-based, inquiry-based, and project based learning create environments in which students work in a more self-directed manner in collaborative teams and develop higher-order thinking skills. Technology can be a positive vehicle for promoting transformation learning when used to support these types of engaging teaching and learning strategies. When engaging teaching and learning strategies are employed in combination with technology tools, students can become explorers, teachers, and cognitive apprentices, producers of knowledge, and directors and managers of their own learning. The use of technology can also provide different methods for the delivery of coursework – both web-based and by video. This provides an opportunity to save our small schools and allow them to offer a broader selection of courses.

North Dakota is basing this state technology plan on **The Nine Essential Conditions and Indicators for Technology Integration**. These conditions and their corresponding indicators were developed by a representative group of North Dakota educators.

These Essential Conditions should be used as a road map to evaluate each district's progress toward integrating technology into its curriculum. This list of essential conditions should serve as a comprehensive list of goals that districts can strive to achieve, and use in the development of *their own* district technology plans. The Nine Essential Conditions and Indicators for Technology Integration will also offer each district a tool to see where they are on the road to **Transformation** in each area.

Essential Conditions – Those conditions (includes processes, objects, perceptions, attitudes, abilities, resources, policies, etc.) that must be in place in order to achieve the desired result. Because desired results usually require several essential conditions to be in place, each essential condition is necessary, but insufficient in itself.

For example, if a person's Desired Result is to lead a healthy lifestyle to increase longevity and their quality of life, then some EC's would include a healthy diet, adequate exercise, mental health, and being in a safe and healthy environment.

Each Essential Condition has a list of indicators associated with it.

Indicator – An indicator provides critical information that indicates the extent to which and essential condition is in place. An essential condition almost always needs more than one indicator to provide a comprehensive story about its status. Indicators typically present values (quantitative or qualitative) that occur on a range or continuum. An indicator's measured value as compared to a desired result, when interpreted in the context of other indicators, allows us to determine the status of an essential condition.

To continue with the Healthy lifestyle example, one essential condition was healthy diet. Some indicators of a healthy diet include:

- Number of servings of fruits and vegetables
- Cholesterol levels
- Number of fast-food meals per week
- Amount of sugar consumed per day

An indicator's value should change in response to an appropriate intervention. Therefore, if an appropriate set of indicators is identified for each essential condition, then interventions can be designed to lead to desired results.

Criteria for a good Indicator:
-Does the indicator provide critical information about the essential condition?
-Does the indicator represent a quantitative or qualitative value?
- Is it likely that some measure can determine the value of the indicator?

Each indicator can be measured as being in one of four states:

Not In Place – The indicator either is not known, understood, or being addressed at this time by some or all of the stakeholders in the district.

Entry – At this stage, educators, students and the community are aware of the possibilities that technology holds for improving learning-but learning, teaching and the system remain relatively unchanged. Educators at this level lack access to technology and the requisite skills to implement and sustain significant changes in practice.

Adaptation – Technology is thoroughly integrated into the classroom in support of existing practice. Educators at this stage have developed skills related to the use of technology, but have primarily applied these skills to automate, accelerate and enhance the teaching and learning strategies already in place.

Transformation – At this stage, technology is a catalyst for significant changes in learning practice. Students and teachers adopt new roles and relationships. New learning opportunities are possible through the creative application of technology to the entire school community.

Below is a list of the Nine Essential Conditions and Indicators for Technology Integration. More details are provided in following pages.

The Nine Essential Conditions and Indicators for Technology Integration

- Shared Vision
- Technology Access and Use
- Leadership Capacity and Proficiency
- Educator Capacity and Proficiency
- Professional Development Program
- Designs for Effective Teaching and Learning
- Technical Support
- Student Experiences and Application
- On-going Evaluation and Continuous Improvement (Accountability)

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1. Shared Vision

The vision that a district has is its map for "getting where they want to go" with technology. Without a clearly defined vision that is known and understood by all staff and the community, everyone will struggle. Although some progress may be made toward integrating technology into the curriculum, without a clear understanding by all stakeholders it will not have the structure or support necessary to move toward transformation.

A pioneering spirit is necessary to take a strong vision and put it into practice in the classroom. It is not acceptable to continue to have students learn in the same way and consider that to be part of a vision, or forward thinking. Technology needs to be used to teach students new ways to learn.

To make the vision become a part of the community, it is necessary to include stakeholders who will assist in the development and the support of the vision. Inclusion of all stakeholders in the process and collaborative, informed planning will foster enthusiasm and urgency for the implementation of the vision.

1	**Shared Vision** **To what extent is the vision of technology integration focused on student learning, research-based, forward thinking and powerful?**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
1.1	Clarity and Articulation: Is the vision clear, shared with all staff and community?	No vision exists or articulated. No communication to all teachers, students, parents, and community.	Vision is vague, not understood. Minimal communication to all teachers, students, parents, and community.	Vision is strong but clarity and communication is still lacking to all teachers, students, parents, and community.	A common vision exists and is clearly articulated by all teachers, students, parents, and community.
1.2	Focused on Student Learning: Is the vision focused on student learning, aligned with current standards and being translated into classroom practice?	No vision exists. No new working or learning practices are evident.	Vision exists but the focus is on the technology itself with very little relationship to curriculum content and/or current standards. Very few new working or learning practices are evident.	Focus shifting from being on the technology more toward the curriculum. Mostly the same stories with new tools about student use are being told. Translation into classroom practice is unclear. Some new practices are evident.	Focus is on using technology for new ways of learning. Business as usual is not accepted. New stories with new tools about student use are being told. Translation into classroom practices is clear and evident.
1.3	Ownership and Commitment: Do all stakeholder groups participate in an ongoing planning process? Is there a sense of urgency to move the vision into practice?	No awareness that a plan exists. No benefits to the community, no partnerships with the community. No sense of urgency. No commitment or enthusiasm exists.	Little awareness of the plan. Assumed commitment. No engagement or participation in planning. No benefits to the community. No partnerships. Enthusiasm/urgency ratings are low.	Some understanding and commitment but not confirmed. Token participation in planning. Implied benefits to community with a few temporary partnerships negotiated. Enthusiasm/urgency ratings are medium.	Feelings of ownership permeate the environment. There is widespread participation in planning and implementation. Enthusiasm/urgency ratings are high.

- It is recommended local school districts include stakeholder groups to assist in the development and support of the vision.

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2. Technology Access and Use

Technology access refers to the general infrastructure necessary to provide and maintain effective and efficient technology deployment and connectivity on an equitable basis. As access to educational resources increases through the use of technology, it is critical that all students in North Dakota have an equal opportunity to participate in technology-enhanced learning. Otherwise, North Dakota risks failure to serve the learners at greatest risk: those with special needs; the very young; older adults; those with limited English proficiency. Also at risk of being left behind are those scoring poorly on standardized test; those from low socio-economic backgrounds; those for whom an historic technology bias exists; and those living in remote areas that lack access to a full spectrum of curriculum choices and informational resources.

The range of technology tools available and the performance capabilities of those tools should be at a level that will support and sustain current learning practices and will also encourage new and innovative learning practices. Local schools and districts should have a plan for updating, refurbishing, and/or replacing hardware and software resources on an annual basis.

Connectivity addresses access to information and communication resources within the school building, the district, the community and the world. Outdated buildings, obsolete hardware/software and the lack of well planned and managed networks make the issue of connectivity difficult and create inequities for students.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of Technology Access and Use. Progress is gauged on three broad indicators of success: Technology Distribution, Tool Capacity, and Connectivity.

2	**Technology Access and Use: To what extent are the availability, organization and capacity of technology tools sufficient to support instructional learning practices?**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
2.1	Technology Distribution: Does the student/workstation ratio meet current recommendations? Is the equipment available for use for anytime, anywhere learning? Is the equipment equitably deployed (gender, race/ethnicity, special needs, grade level, classroom, etc.)?"	25+: 1 student/workstation ratios (aging equipment not factored). Equipment primarily in labs. Almost no time available for sign-up after scheduled classes. Significant access obstacles. Almost no mobility nor flexibility of equipment. No equity of equipment deployment, apparent or planned, between classrooms, buildings, grade levels.	10-24:1 student/workstation ratio. Equipment primarily in labs with some unscheduled time for sign-up. Some equipment available for rooms or sign-out. Significant access obstacles. Some mobility and flexibility with no efforts to increase. Awareness of equity but no planning begun to resolve the disparity between classrooms, buildings, and grade levels.	6-9:1 student/workstation ratio. Equipment located in labs and classrooms but in inadequate ratios. Labs are mostly unscheduled and available for sign-up. Access obstacles still exist for many. Some mobility and flexibility. Equity issues identified and planning has begun to begin resolving the disparity.	2-5:1 student/workstation ratio. Equipment distributed to classrooms and adjacent learning areas in adequate ratios for anytime, anywhere learning. Access obstacles have been removed. Mobility and flexibility are high. Equity issues have been addressed with plans in place for continual monitoring and resolution of equity between classrooms, buildings and grade levels.
2.2	Tool Capacity: Are a range of technology tools (including peripheral devices and software) available as resources for instruction? Are there policies/procedures for equitable replacement of equipment in place? Is a plan in place for the selection and purchase of software?	Vast majority of equipment primarily computer workstations, with very little access to peripherals (printers, scanners, digital cameras, probes, etc.). Has older, outdated equipment that sits alone. No replacement or equity policies in place. No standardizing of software. Great number of software titles purchased without rationale.	Limited access available to only basic resources (e.g., computer and printer, phone, TV). Awareness of the need of replacement and equity policies. Working toward standardization of software tools. Large numbers of software titles purchased without rationale.	Some access to intermediate resources (e.g., computer has printer and 1 - 2 peripherals). Starting to build a system. Development of replacement and equity policies is in progress. Software standardization established (basic software applications are used school-wide) but shopping sprees for additional titles continues.	Access to a broad range of resources for integration (e.g., computer and 3 or more peripheral devices like cameras, scanners, projectors, AlphaSmarts, etc.). Replacement and equity policies are in place. Software tools are standardized with formal processes for adding additional software system-wide.
2.3	Connectivity: Are LANs and WANs robust and stable? Is Internet access available to all students?	Only Local Area Networks (LANs) exist, if any connectivity at all. Wide Area Networks (WANs) do not exist. Less than 15% of computers are connected to the Internet.	LAN/WAN is incomplete--15-49% of computers are connected. Networks are frequently unstable and undependable. Access to the Internet is possible but requires significant planning.	LAN/WAN is in place with more than 50% of computers connected. Networks are occasionally unstable and undependable. Access to the Internet is easy with some planning.	LAN/WAN is in place with more than 70% of computers connected. Networks are robust and stable. Access to the Internet is easily available to more than 50% of the classrooms.

- It is recommended that local school districts have a range of technology tools available with performance capabilities at a level that will support and sustain current learning practices and will also encourage new and innovative learning practices.

- It is recommended that schools and districts have a plan for updating, refurbishing, and /or replacing hardware and software resources.

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Leadership Capacity and Proficiency

Administrators at the building and district level greatly influence changes in the culture of a school. Because this is so, they should model the effective use of technology in support of learning and administrative functions and be expected to maintain a solid knowledge of the applications of technology to student learning.

They should value and foster an environment that encourages teachers to try new approaches to learning and to stretch the limits of what is possible when applying technology to learning. Teachers must be made to feel that they are operating within an environment that values collaboration, experimentation and learning from failure.

Administrators should initiate and support professional development processes that reflect attention to principles of adult learning.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of Leadership Capacity and Proficiency. Progress is gauged on three broad indicators of success: Effective Technology Use, Advocacy, and Support Professional Development.

3	**Leadership Capacity and Proficiency: To what extent is appropriate, necessary leadership present to successfully guide technology and learning initiatives?**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
3.1	Effective Technology Use: Are the leaders expected to be proficient and effective in using technology? Do the leaders use technology to accomplish administrative tasks?	No specific skills or practices for leaders are identified or expected. Computerized administrative tasks are done by staff, if they are done at all with technology.	Specific skills are identified but not expected. Technology use is infrequent, mostly for personal tasks. Delegates administrative technology tasks to support staff.	Specific skills and practices are identified and expected but not supported in substantial, effective ways. Uses technology to support their work but only in specific instances.	Specific skills and practices are identified, expected and supported in substantial, effective ways. Use technology to support their works in multiple ways.
3.2	Advocacy: Do the leaders visibly take ownership and develop strategies to put vision into practice? Do the leaders convey a sense of urgency about technology use for student learning? Do leaders support innovative models? (portable classrooms, e-pals, teacher collaborative projects, etc.). Do leaders provide for the funds necessary to successfully integrate technology?"	No stewardship. No strategizing to move vision into practice is evident. No sense of urgency. Says nothing - as if technology is not in their realm of awareness or workplace. No innovators are evident among the staff, no effective curriculum models, no communication of success stories or leadership is evident. Funding is non-existent or severely lacking.	Leaders indicate compliance to the vision by investigating/ identifying the issues but no strategizing for moving vision into practice. Does not promote a sense of urgency. Is aware of technology but doesn't own the initiative either by word or deed. A very small percent of staff are piloting new instructional models. Innovation is not advocated or encouraged. Status quo is the norm. Funding is very limited or sporadic.	Leaders talk the vision but delegate moving the vision into practice to others. Promotes student use of technology but feels powerless about the issues. Expects technology to be used but doesn't measure the uses. Development of innovative instructional models is encouraged. Funds for technology support are optional and available primarily through special initiatives, grants, etc.	Stewardship/ownership is evident. There is ongoing strategizing for moving vision into practice. Student use of technology is held with urgency. Expects and measures regular student use of technology. Development of innovative instructional models is expected. Funds are available to adequately support the integration of technology in the classroom.
3.3	Support Professional Development: Do the leaders support an effective professional development model? (technology lunches, mentors, train-the-trainer, etc.) Are professional development opportunities made available? Are they supported by adequate resources? Are professional development activities assessed for appropriateness and effectiveness?	No support/ expectations regarding professional development. Few professional development opportunities and/or resources to support them are available. No assessment procedures in place.	Indicates compliance to the vision by supporting professional development, but with limited resources. No assessment procedures in place.	Indicates compliance to the vision and supports professional development with temporary resources. Is aware that assessment procedures are essential for success but assessment is optional and sporadic.	Expects compliance to the vision and actively and visibly supports professional development by providing the necessary resources and assessment procedures to insure success.

- It is recommended that local school district leaders model the effective use of technology.
- It is recommended that local school district leaders foster an environment that encourages teacher to try new approaches to learning with technology without fear of reprisal.
- It is recommended that local school district leaders initiate and support professional development opportunities for all faculty and staff.

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4. Educator Capacity and Proficiency

Technology in schools has the potential to enhance and transform teaching practices and student learning. It provides opportunities for educators to break through isolation and serves as a catalyst for significant changes in learning practices. Educators should be skilled in the use of a variety of models of curriculum design and learning strategies that are supported by technology.

Educators should possess skills that allow them to be innovators in a technology-rich environment. The visibility of "early adopters" who are developing and communicating successful curriculum models of effective technology uses should be present. If educators are not effective users of technology, it is unlikely they will recognize how technology can be used inside their classroom. Educators must be prepared to support students in achieving high academic performance through the effective use of technology.

The table below provides more detail on the continuum of progress from entry level to adaptation level, to transformation with regard to the essential condition of Educator Capacity and Proficiency. Progress is gauged on three broad indicators of success: Tool Mastery, Expectations and Focus, and Innovators.

4	**Educator Capacity and Proficiency: To what extent are educators prepared to support students in achieving high academic performance through the effective uses of technology?**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
4.1	Tool Mastery: To what extent has the staff mastered essential tools that meet building or district needs or expectations?	Less than 15% of staff has mastered the essential tools.	15-49% of staff has mastered the essential tools.	50-70% of staff has mastered the essential tools.	More than 70% of staff has mastered the essential tools.
4.2	Expectations and Focus: What technology skills and classroom practices are expected? Is the flashlight on the curriculum or the technology itself?	No expectations are established for teacher skills and practices. An expert (technology coordinator, computer instructor, etc.) is primarily responsible for teaching students. Developing technology skills is the primary identified use.	No formal expectations for skills and practices. Teachers' use is optional. The focus is a mixture of mostly technology skills with some adaptive uses (same stories with new tools).	Formal expectations for skills but not practices have been identified. Teachers' use is optional but encouraged. The focus is on a mixture of mostly adaptive uses (same stories with new tools) with some transformational uses (new stories with new tools) along with developing some new technology skills.	Formal expectations for skills and practices have been identified. Teacher use is expected and supported. The focus is primarily on transformational uses (new stories with new tools) with a mixture of some adaptive uses (same stories with new tools) and developing some new technology skills,
4.3	Innovators: What percentage of staff are innovators? Are there visible signs of effective instructional models? Are success stories being told?	No innovators are identified. No evidence of effective instructional models. No stories being told.	1-8% of the staff is exploring and piloting effective new uses of technology and developing new instructional models. Communication of success stories is infrequent and barely evident.	9-15% of the staff is exploring and piloting effective new uses of technology and developing new instructional models. Communication of success stories is infrequent but evident.	16-24% of the staff is exploring and piloting effective new uses of technology and developing new instructional models. Communication of success stories is frequent and pervasive.

- It is recommended that educators be skilled in the use of a variety of models of curriculum design and learning strategies that are supported by technology.

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5. Professional Development

The most important success factor for student learning is teacher quality. Professional development is the key to increasing teacher quality and the transformational use of technology. A comprehensive professional development process should be in place to ensure that technology is used effectively to create new opportunities for learning and to promote student achievement. Through professional development, educators should become proficient at integrating technology into curriculum, aligning it with student learning goals/standards, and using technology as a tool for engaged learning projects.

Professional development for technology use should be a critical and integrated part of local school technology plans. Professional development programs should be ongoing, tied to curriculum standards, designed with built-in evaluation, and sustained by adequate financial and staff support. The professional development program should include components such as hands-on technology use, a variety of learning experiences, curriculum-specific applications, new roles for students and teachers, and collaborative learning to name a few.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of Professional Development Programs. Progress is gauged on three broad indicators of success: Professional Development Content, Professional Development Process, and the Sustainability of the Professional Development Program.

5	**Professional Development Program: To what extent are the professional learning opportunities designed to enable instructional staff to successfully practice technology- supported, standards-based instruction?**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
5.1	Content: Is the major content focus on the technology (learning tools) or the pedagogy (research-based instructional practices)? Does the content address knowledge of technology and curriculum standards? Does the content provide curriculum connections supported by technology? Are specific skills and practices identified, expected and measured for student results?	No formal professional development program is available. Content is limited to "hot" topics with no connection to the curriculum. No specific skills or practices are identified, expected or measured.	Content focus is on learning technology hardware and software and developing skills. Standards are not addressed. Technology is seen as an "extra", very loosely connected to the curriculum. A Limited number of specific skills or practices are identified and are not expected or measured.	Content focus is on learning tools along with pedagogy but does not focus on research-based practices. The teachers are encouraged to "do something--do anything". There is an awareness of standards but they are not specifically addressed. Content assumes the teachers will make the curriculum connections by themselves. Specific skills or practices are identified, but are not always expected or measured.	Content focus is on research-based practices and pedagogy necessary to deliver high quality curriculum. Tools are learned as needed within the context of how they would add value to learning. Connections tying technology with the curriculum are pervasive. Specific skills and strategies are expected and measured.
5.2	Process: Does the professional development program/model provide comprehensive means/methods to acquire new knowledge and skills? Is there a balance between "overview" type professional development and ""deep"" professional development? How many have participated in professional development opportunities?"	No staff development program is available. Less than 15% of staff participates in all aspects of professional development.	No staff development options are available beyond workshops and conferences. Attendance is optional with no real rewards or penalties. Professional development activities are superficial, providing little opportunity to gain "in-depth" knowledge. 15-49% of staff participates in all aspects of professional development.	A variety of professional development workshops and conferences are made available and are recommended by leadership but not required. Workshops provide a balance of overview and in-depth activities. 50-70% of staff participates in all aspects of professional development.	Staff development options are expanded and required beyond workshops and conferences including real-time coaching/mentoring on-site and some are required. More than 70% of staff participates in all aspects of professional development.

	Essential Condition	Not in Place	Entry	Adapting	Transforming
5.3	Sustainability: Are multiple sustainable elements (budget, leadership, adequate staffing, incentives, policies, accountability, etc.) in place? Are expectations established for skills and practices for all teachers and staff? Are technical support staff expected and given the opportunity to maintain a current knowledge base? Are the skills acquired assimilated into the classroom?"	No sustainable elements are in place. No specific skills or practices for teachers and staff are identified, expected nor applied.	Several sustainable elements are in place on a very limited budget. Specific skills are focused on "literacy" but not expected. Technical support staff is expected to learn on their own. There is little evidence of newly acquired skills being applied in the classroom.	Multiple sustainable elements are beginning to be put in place. Less than 10% of technology budget is devoted to professional development. Specific skills and practices are focused on "adapting" or automating present instructional tasks for students. Skills and practices have been identified but not likely to be expected. Technical support staff is provided opportunities for keeping current attendance is optional. Occasional applications of newly acquired skills are evident in the classroom.	Multiple sustainable elements are in place. At least 25% of technology budget is devoted to professional development. Specific skills and practices are focused on "transforming" uses for students. Technical support staff is expected to partake in opportunities for improving their knowledge and skills. Application of newly acquired skills in the classroom is clearly evident.

- It is recommended that local school districts provide opportunities for educators to become skilled in the use of a variety of models of curriculum design and learning strategies that are supported by technology.

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6. Designs for Effective Teaching and Learning

The effective use of technology enables educators to implement new teaching techniques aimed at increasing student learning through engaging authentic activities. Teachers who use technology as a tool to support strategies such as problem-based, inquiry-based, and project-based learning create environments in which students work more self-directed n collaborative teams and develop higher-order thinking skills. Technology can be a positive vehicle for promoting transformation learning when used to support these types of engaging teaching and learning strategies. Technology creates increased opportunities for students to work on authentic tasks and challenging program, often connecting with peers, community members, or experts in the field.

When engaging teaching and learning strategies are employed in combination with technology tools, students can become explorers, teachers, and cognitive apprentices, producers of knowledge, and directors and managers of their own learning. The teacher's role changes in that teachers become facilitators, guides, and co-learners. In this new learning environment, learning tasks are authentic, challenging, and multidisciplinary. Assessment is a seamless part of the learning process and focuses on measuring student performance in authentic ways.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of Designs for Effective Teaching and Learning. Progress is gauged on seven broad indicators of success: Instructional Practices, Curriculum Linking, Attitude Toward Technology, Pedagogical Readiness, Assessment, Standards-based Instruction, and Information Technologies.

6	**Designs for Effective Teaching and Learning: To what extent are the teachers using technology to create and support a student-centered learning environment.**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
6.1	Instructional Practices: What percentage of classroom instruction is student-centered (independent/collaborative processes)?	Less than 15% of classroom focus is on student-centered processes.	15-49% of classroom focus is on student-centered processes.	50-70% of classroom focus is on student-centered processes.	More than 70% of classroom focus is on student-centered processes.
6.2	Curriculum Linking: Is there an effective link between curriculum and the use of technology?	Technology uses are primarily a peripheral activity with no connection to the curriculum.	Student technology uses are primarily focused on the technology tools, not the curricular content.	Student technology uses have a mixture of some technology skills, mostly integrating, and some evolving uses. Technology uses primarily focused on adapting current curriculum content with the use of new tools.	Student technology uses have a mixture of some technology skills, some integrating, and mostly evolving uses. Curriculum content is in the spotlight with technology playing the supporting role.
6.3	Attitude Toward Technology: How do teachers feel about the use of technology as an instructional tool?	No relevance is seen in the use of technology in education.	Technology is seen as a content area separate from other content instruction (used as a reward or for remedial work).	Technology is put into the curriculum but is primarily used to replace already existing practices (for example, the instructor uses an on-line worksheet instead of his/her traditional paper version).	Used as an indispensable resource for learning that would not be possible without technology.
6.4	Pedagogical Readiness: Are instructional strategies aligned with “evolving” uses of technology? (Innovative learning practices; cooperative grouping, multiple intelligences, problem-based learning, etc.)	1-15%of staff are planning their instructional practices to align with "evolving" uses of technology.	16-49% of staff are planning their instructional practices to align with "evolving" uses of technology.	50-74% of staff are planning their instructional practices to align with "evolving" uses of technology.	75-100% of staff are planning their instructional practices to align with "evolving" uses of technology.
6.5	Assessment: What assessment practices are used? Are multiple assessments used to measure the same competencies? Are assessments effective? Are technology tools employed for assessment?	Assessment is very limited. Technology is not employed as a tool for assessment.	A single assessment strategy is employed, but it is usually focused on the technology rather than the curriculum content. Technology is seldom used as a tool for assessment.	There is occasional use of multiple assessment techniques. The assessment tools measure student achievement in the content separate from their appropriate use of technology. There is also occasional use of technology as a tool for assessment.	Multiple methods of assessment are employed. The assessments measure student achievement of the learning goals as well as their appropriate use of technology. Technology is used as a tool for the development and delivery of assessments.

	Essential Condition	Not in Place	Entry	Adapting	Transforming
6.6	Standards-based Instruction: Is technology supporting standards-based instruction?	Less than 15% of the lesson plans/units are correlated to standards and indicate technology usage levels.	15-49% of the lesson plans/units are correlated to standards and indicate technology usage levels.	50-70% of the lesson plans/units are correlated to standards and indicate technology usage levels.	More than 70% of the lesson plans/units are correlated to standards and indicate technology usage levels.
6.7	Information Technologies: How often is technology used for information research?	Use of investigation, research or knowledge construction skills is never or seldom.	Use of investigation, research or knowledge construction skills is 3-4 times a year.	Use of investigation, research or knowledge construction skills is at least monthly.	Use of investigation, research or knowledge construction skills is at least weekly.

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7. Technical Support

Adequate and consistent funding is essential to successful integration of technology in schools. Schools should provide funding mechanisms for on-going costs of training teachers, employing and training technical support staff and equipment replacement.

Schools should provide adequate ratios of support personnel based on the size and complexity of the environment to ensure adequate response time and customized support to meet the instructional and equipment maintenance needs of each building site.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of Technical Support. Progress is gauged on five broad indicators of success: Budget, Support Personnel, Equipment Maintenance, Response Time, and Software Support.

7	**Technical Support: To what extent is hardware and software support available to ensure successful instructional and learning practices.**				
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
7.1	Budget: Does the budget allow for real-time technical support? Can support personnel make critical purchases necessary to keep technology functional?	Inadequate system and building site budgets (panic service). Resources are not budgeted for "just-in-time" repairs and maintenance.	Inadequate system and building site budgets (limping along). Resources are very limited and it is highly unlikely that major repairs and/or maintenance can be made.	System budgets are building capacity (sporadic but managing).	System budgets, personnel and processes are in place (real-time support).
7.2	Support Personnel: Is there an adequate ratio of personnel (1 full-time support person to 100 workstations or less) to support hardware demands?	Personnel ratios (1 full-time support person to 500+ workstations) are inadequate based on criteria that would ensure customized support.	Personnel ratios (1 full-time support person to 300-499 workstations) are inadequate based on criteria that would ensure customized support.	Personnel ratios (1 full-time support person to 101-299 workstations) are less than adequate.	Adequate designated personnel ratios (1 full-time support person to 100 workstations, or less) are calculated using criteria to ensure customized support for each building's site needs.
7.3	Equipment Maintenance: Is the equipment maintained to maximize instruction?	Equipment is not maintained or updated; functionality is poor.	Isolated individuals are maintaining and updating their own equipment. If some maintenance exists, it is sporadic, irregular and primarily off-site. Functionality is severely hampered.	A support system exists to maintain and update equipment, however maintenance is irregular. A building support person is designated in addition to other work responsibilities. Functionality is sometimes impaired.	Real-time support in place providing on-site, continuous maintenance. Transparent functionality supports instruction and learning across all classrooms.
7.4	Response Time: Is response time adequate?	No response. Support personnel cannot respond to hardware maintenance, software installations, etc. needs without serious disruption of the learning activities.	Response time is frustrating, primarily off-site, and sporadic. Maintenance is irregular.	Reasonable response time; however response time is still sporadic with irregular maintenance.	Real-time, just-in-time support in place providing on-site, continuous maintenance. There is no or very minimal disruption of learning activities.
7.5	Software Support: Is software support sufficient?	Software is not installed, maintained, or updated. Functionality is poor. Instruction and learning are impaired.	Isolated individuals are installing, maintaining and updating their own software. If some support exists, it is sporadic and irregular. Copyright and license issues are not addressed. Instruction and learning are impaired for most classrooms.	System is in place to install, maintain, and update software but maintenance is irregular. Copyright and license issues are not consistent. Instruction and learning are somewhat hindered but functioning.	Software is installed, maintained and up-to-date and functions reliable. Copyright and license issues are addressed on an ongoing basis. Supports instruction and learning across all classrooms.

- It is recommended that local school districts provide funding mechanisms for on-going costs of employing and retaining adequate technical support staff.

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8. Student Experiences and Application

Essential to the vision is an emphasis on meaningful, engaged learning with technology, in which students are actively involved in the learning process. Students should take ownership of their learning, acting as explorers and information seekers; teachers function as facilitators and guides. Used effectively, technology can encourage collaborative learning, development of critical thinking and communication skills. It can help learners explore the world beyond the classroom by providing access to outside resources and information.

What do students need to learn, and how can technology promote those learning goals? Educators need to determine if the specific purpose of the technology addresses the school's goals for student learning. A clear set of goals, expectations, and criteria for student learning should be based on national and state standards. Only then can plans be made for purchasing equipment and materials, and for assessing how well the technology helps achieve the goals.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of Student Experiences and Application. Progress is gauged on five broad indicators of success: Achievement of Standards, Students as Information Seekers, Students as Critical Thinkers and Creators of Knowledge, Students as Communicators, and Students as Technologists.

	Essential Condition	Not in Place	Entry	Adapting	Transforming
8	**Student Experiences and Application:**	**To what extent do students apply technology and communication tools in their daily lives, work situations and learning environments?**			
8.1	Achievement of Standards: Does student work produced with technology demonstrate achievement of content standards and learning objectives?	Less than 15% of student work demonstrates content standards/learning objective competencies.	15-49% of student work demonstrates content standards/learning objective competencies.	50-70% of student work demonstrates content standards/learning objective competencies.	More than 70% of student work demonstrates content standards/learning objective competencies.
8.2	Students as Information Seekers: Do students use technology to acquire information? How often?	Less than 15% of students use technology weekly to acquire information.	15-49% of students use technology weekly to acquire information.	50-70% of students use technology weekly to acquire information.	More than 70% of students use technology weekly to acquire information.
8.3	Students as Critical Thinkers and Creators of Knowledge: Do students effectively analyze and select information from gathered data and generate new knowledge bases?	Learning tasks have little relevance to content.	Learning tasks require little analysis. Focused more on simplistic tasks/concepts using a single source. "Cookie cutter" look-alike products likely to develop.	Learning tasks require an analysis of information and/or putting together of information from several sources to demonstrate understanding of existing knowledge.	Learning tasks require synthesis of multiple sources of information, going beyond understanding to create original products. Generation of new knowledge.
8.4	Students as Communicators: Do students communicate their learning using appropriate technologies to genuine audiences	Less than 15% of students demonstrate the ability to communicate to express their learning to genuine audiences.	15-49% of students demonstrate the ability to communicate to express their learning to genuine audiences.	50-70% of students demonstrate the ability to communicate to express their learning to genuine audiences.	More than 70% of students demonstrate the ability to communicate to express their learning. More than 80% of students have email addresses.
8.5	Students as Technologists: Do students use these tools at a level that matches local, state and national standards?"	Less than 15% of students can apply technology at a level that aligns with technology standards.	15-49% of students can apply technology at a level that aligns with technology standards.	50-70% of students can apply technology at a level that aligns with technology standards.	More than 70% of students can apply technology at a level that aligns with technology standards.

- It is recommended that local school districts provide opportunities for students to use technology to promote collaborative learning and the development of critical thinking skills.
- It is recommended that local school districts provide a clear set of goals, expectations, and criteria for student learning based on national and state standards.
- It is recommended that local school districts create opportunities for students to work on authentic tasks and -to communicate with peers, community members, or experts in the field.

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9. On-going Evaluation and Continuous Improvement

Federal and state agencies, local school boards and the general public for that matter, require schools to be accountable for their actions. A systematic process should be in place for continuous assessment, evaluation and reporting the extent to which students are progressing and whether educational objectives are being met.

Assessment tools should be varied and provide adequate baseline data that will support accountability. Conclusions of instructional results should be communicated and used to support data-driven decisions.

The table below provides more detail on the continuum of progress from entry to adaptation, to transformation with regard to the essential condition of On-going Evaluation and Continuous Improvement. Progress is gauged on four broad indicators of success: Process, Funding, Data Collection, and Results Communicated.

9	**On-going Evaluation and Continuous Improvement: (Accountability)**	**To what extent is the system continuously assessing, evaluating and reporting its capacity to adapt and organize for student results.**			
	Essential Condition	**Not in Place**	**Entry**	**Adapting**	**Transforming**
9.1	Process: Is there a systematic process for data to be shared and communicated?	No systematic process to share data exists.	A systematic process for data to be shared is optional.	A systematic process for data to be shared is expected but not required.	A systematic process for data to be shared is expected and required.
9.2	Funding: Is the funding for assessment and evaluation robust in order to support accountability and results-driven decisions?	Data collection process is not staffed, budgeted nor conducted. 0% of the total technology budget.	Data collection processes are conducted when requested--staff and funds have to be found. 1-3% of the total technology budget.	Data collection processes are expected at the end of implementation only--staff and funds have to be found. 4-7% of total technology budget.	Data collection processes are staffed and budgeted for continuous feedback. 8% or more of the total technology budget.
9.3	Data Collection: Are assessment tools and processes adequate to chart progress?	No data is collected. Student results are not identified nor measured.	No baseline data is available. Assessment strategies are assumed or limited. No student results are identified.	Some baseline data is available. System assessment is informal and varied tools and processes are optional. Student results are identified after the fact and measurement is done without baseline data.	A variety of baseline data are available. System assessment is formal, coordinated and quantified. Student results are identified prior to implementation and measured continuously against baseline data.
9.4	Results Communicated: Are conclusions of instructional results of technology uses communicated and used?	No communication process is place for feedback.	Findings from assessment not adequate to allow for conclusions/reporting. Communication on accountability is provided only upon request.	Findings allow for conclusions but not for systemic conclusions/reporting. Communication of progress is regular but focused on efforts rather than results.	Findings allow for systemic conclusions/reporting. Communication of progress is regular and focused to report on pre-determined targets for results.

- It is recommended that local school districts develop a systemic process for continuous assessment, evaluation and reporting the extent to which students are progressing and whether educational objectives are being met.

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Funding

The State of North Dakota has funded a T1 connection at each high school in the state. This is a connection to the infrastructure that connects all State and County agencies in North Dakota. This connection to the WAN has been provided for the 2001-2003 school years at no cost to the school. This encompasses bringing a connection to the network into the high school and does not include any internal connections or wiring of middle or elementary schools. The infrastructure is of a nature that makes video conferencing and distance learning a possibility – presuming the funding continues to exist. Many schools will also offer improved administrative capacity for records management and the sharing of information. Importantly, this technology is being deployed in an equitable manner to all high schools to ensure equal access for each student.

Currently, the State of North Dakota continues to provide schools with ongoing funding for technology purchases based on enrollment. Special attention including technical assistance and additional funding are made available to schools with predetermined numbers of students that fall within certain poverty guidelines.

The North Dakota Department of Public Instruction administers grant money from the Department of Education that is allocated specifically for schools to make technology purchases. These purchases must fall within the guidelines of the Federal program and must supplement, and not supplant, other state or local funds. The Teaching With Technology program is funded through a Federal Technology Integration Challenge Grant. It is jointly administered by the North Dakota Department of Vocational and Technical Education and the Center for Innovation in Instruction and offers technology integration training for teachers and administrators throughout the state.

Although funding is available from both State and Federal sources, these funds are not capable of addressing all of the needs of each district.

- Individual districts are encouraged to use local mills as the foundation of a consistent and ongoing technology budget. They should also investigate other options for funding technology.
- Schools should seek grants and local donations.
- Schools are encouraged to participate in group purchase programs with other districts or consortiums
- Schools should evaluate all options for acquiring technology including leasing.
- If schools receive discounts for telecommunications services (i.e. e-rate, or a free connection to the ND State Network) they should budget equivalent local funds for ongoing technology needs.

Every effort has been made by the writers of this document to follow Section 5213. STATE PLANS of H.R.1 “No Child Left Behind Act of 2001” and “e-Learning Putting a World-Class Education at the Fingertips of All Children” the National Educational Technology Plan.

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